NORTH CENTRAL FOREST EXPERIMENT STATION

Research Note NC-243

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SPRUCE BUDWORM DEFOLIATION IN MINNESOTA: 1954-1977

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ABSTRACT.— A series of maps showing spruce budworm defoliation in Minnesota, 1954-1977.

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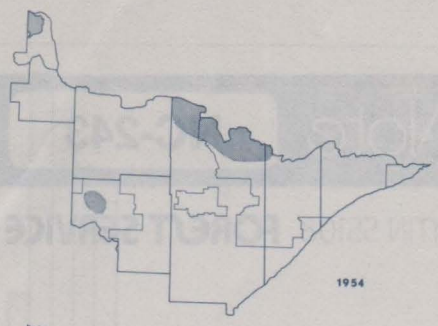
The spruce budworm, *Choristoneura fumiferana* (Clemens) is one of the most destructive insect pests of the spruce-fir forests of North America. Between 1910 and 1925 the budworm destroyed 200 million cords of balsam fir and red spruce in the eastern United States and Canada (Metcalf *et al.* 1962). Brown (1970) mapped the spread of spruce budworm outbreaks from 1909 to 1966 in eastern Canada and northern Minnesota. The most recent outbreak in Minnesota (before the present infestation) occurred from 1912 through 1926 (Blais 1968).

This report documents the amount and location of budworm defoliation in northern Minnesota from 1954 through 1977.

The current outbreak was first detected in Minnesota in 1954 along the Canadian border north of Ely and on the Kabetogama Peninsula east of International Falls. The budworm defoliation increased in area and severity until 1958 when nearly 1 million acres were affected (fig. 1). No formal survey was conducted in 1962. Defoliation continued until 1963 when Ryan and Batzer (1964) reported a decrease in budworm population. As a result of the extended defoliation, up to half (10-50 percent) of the balsam fir died on 112,200 acres and more than half (51-100 percent) died on an additional 130,200 acres.

Because budworm population was low, no extensive surveys were made in 1964 and 1965. However, in 1966 Doerner[1] found heavy defoliation in small areas in the Superior National Forest. Since then, defoliation gradually expanded southward from spruce-fir types along the Canadian border to those in the southern and western portions of the Superior National Forest and adjoining State and private land.

[1]*Doerner, Robert G. 1966. Detection survey of spruce budworm on the Superior National Forest, 1966. Unpublished processed Rep. (File 5220, 2 p).*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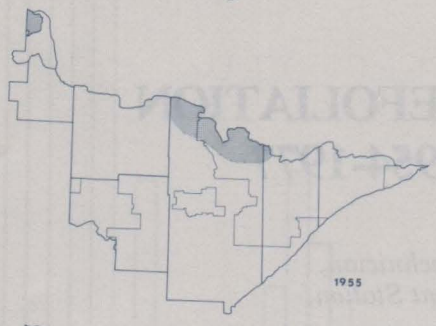
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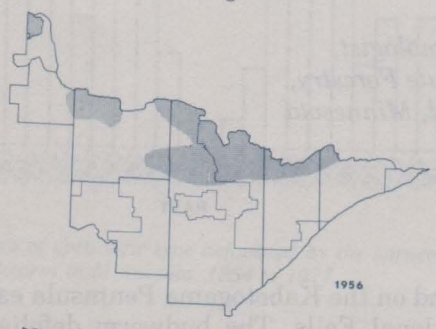
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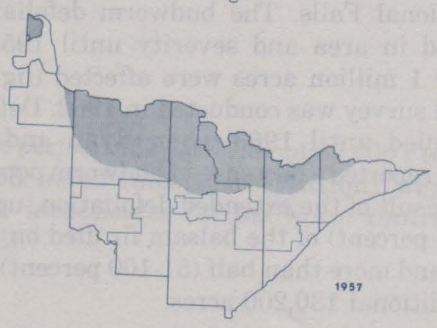
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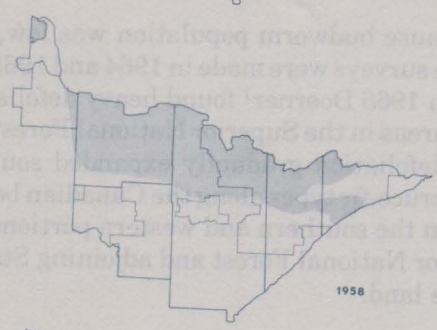
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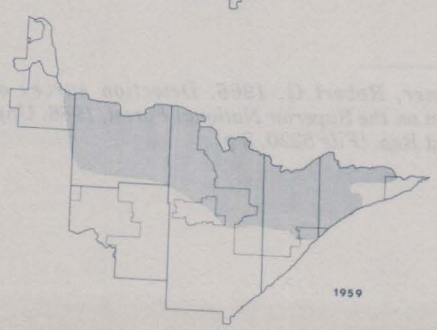
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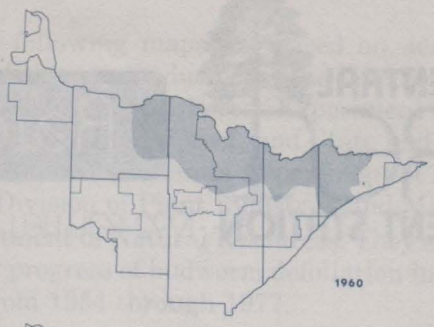
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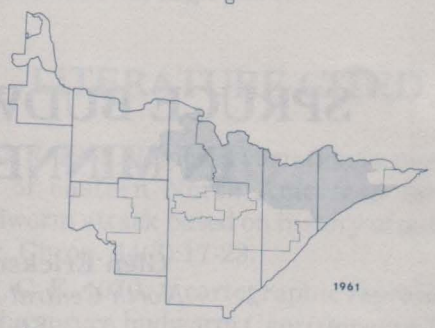
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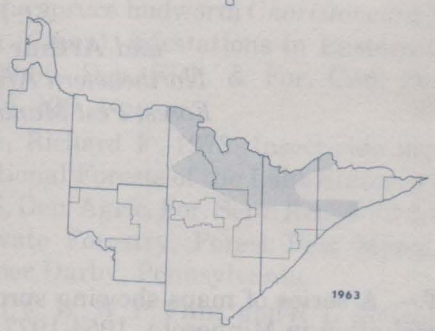
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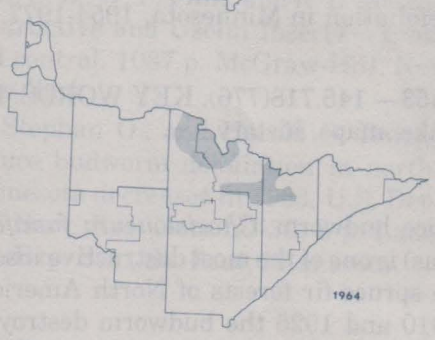
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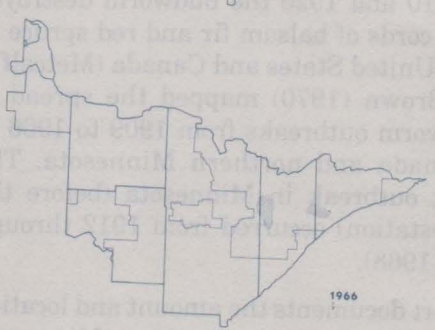
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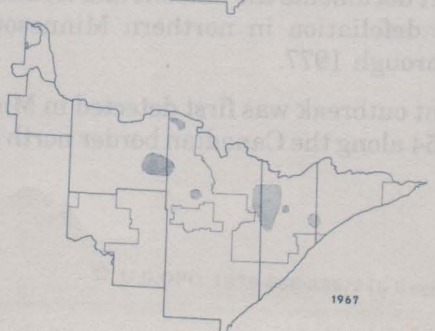
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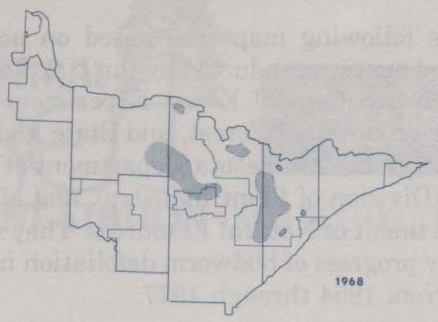
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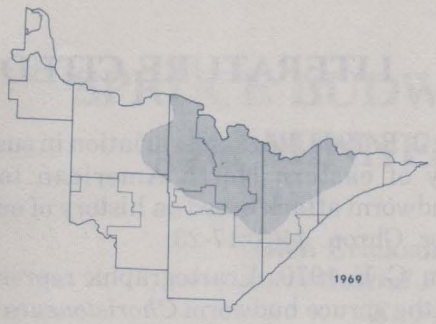
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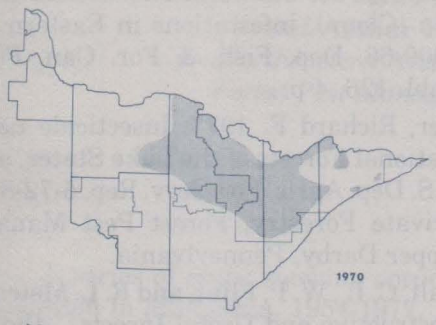
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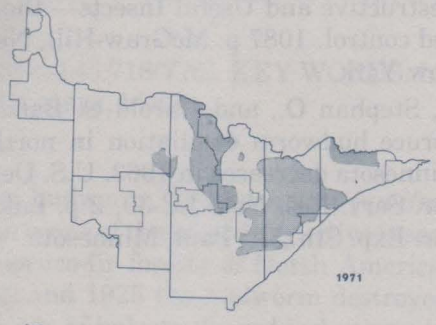
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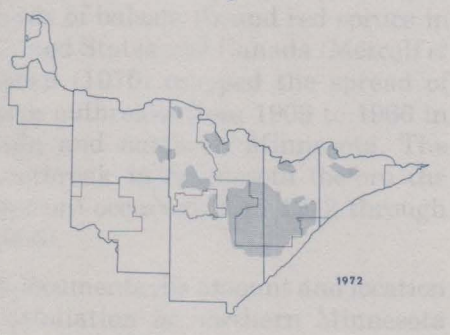
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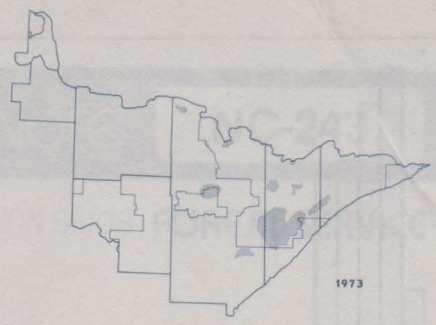
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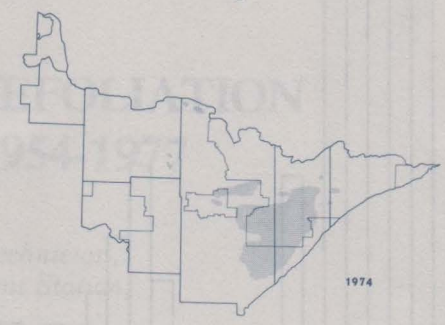
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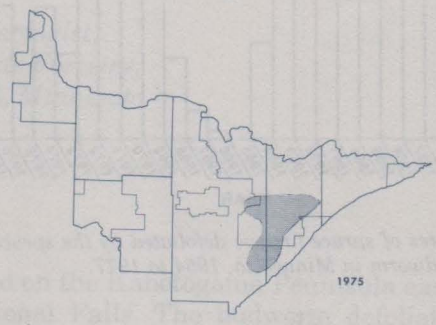
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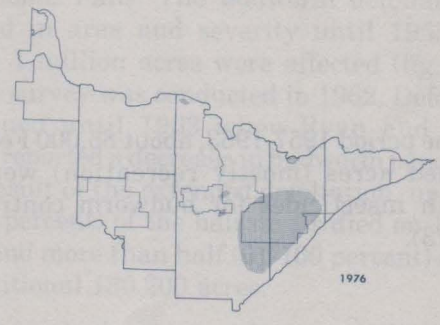
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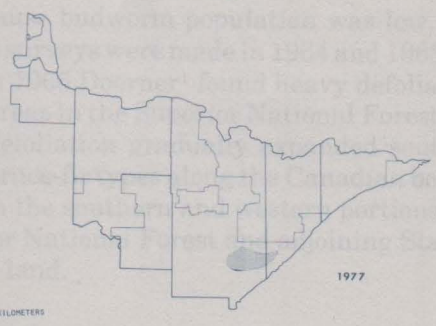
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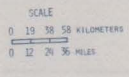
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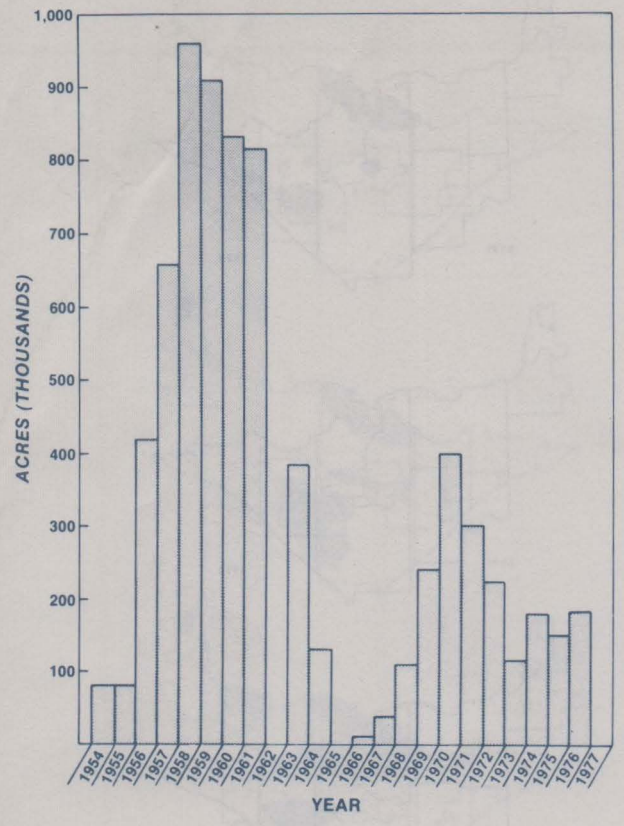

Figure 1.—*Acres of spruce-fir type defoliated by the spruce budworm in Minnesota, 1954 to 1977.*

During the period 1957-1963, about 85,000 Federally owned acres (mostly recreation) were treated with insecticides for budworm control (Fowler 1973).

The following maps are based on aerial and ground surveys conducted by the U.S. Forest Service (North Central Forest Experiment Station, Superior National Forest, and State and Private Forestry), the Minnesota Department of Agriculture (Division of Plant Industry), and Minnesota Department of Natural Resources. They show the yearly progress of budworm defoliation in Minnesota from 1954 through 1977.

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